Concepts of Keys

Duration : 2hrs

Detailed Syllabus

2.2. Concepts of Keys

- Candidate key
- Primary key
- Alternate key
- Composite key
- Surrogate key
- Foreign key

2.3. Fundamental Integrity Rules

- Entity Integrity
- Referential Integrity
- Domain Constraints
- Key Constraints

Relational Objects

Keys

- ***Primary Key:*** An attribute (or combination of attributes) that uniquely identifies each row in a relation.
  - Employee(Emp_No, Emp_Name, Department)
- ***Composite Key:*** A primary key that consists of more than one attribute
  - Salary(Emp_No, Eff_Date, Amount)

Relational Objects

Data is presented to the user as tables:

- Each table has a ***primary key***. The primary key is a column or combination of columns that uniquely identify each row of the table.

Employee

E-No	E-Name	D-No
179	Silva	7
857	Perera	4
342	Dias	7

Primary Key

Salary

E-No	Eff-Date	Amt
179	1/1/98	8000
857	3/7/94	9000
179	1/6/97	7000
342	28/1/97	7500

←Primary Key→

Relational Objects

Data is presented to the user as tables:

- The ***cardinality*** of a table refers to the number of rows in the table. The ***degree*** of a table refers to the number of columns.

Salary Table

Degree = 3

Cardinality = 4

Salary

E-No	Eff-Date	Amt
179	1/1/98	8000
857	3/7/94	9000
179	1/6/97	7000
342	28/1/97	7500

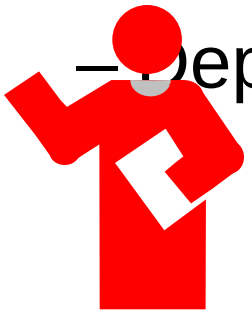
Entity integrity, referential integrity/foreign keys

- Entity integrity constraint specifies that no primary key can be null
- The referential integrity constraint is specified between two relations and is used to maintain the consistency among tuples of the two realtions
- Informally what this means is that a tuple in one relation that refers to another relation must refer to an existing tuple.
- To define referential integrity we use the concept of foreign keys.

Relational Objects

Relationship

- ***Foreign Key:*** An attribute in a relation of a database that serves as the primary key of another relation in the same database
  - Employee(Emp_No, Emp_Name, *Department)*
  - Department(Dept_No, Dept_Nam



=== works for ==>

Relational Objects

Data is presented to the user as tables:

- A ***foreign key*** is a set of columns in one table that serve as the primary key in another table

Employee

E-No	E-Name	D-No
179	Silva	7
857	Perera	4
342	Dias	7

Primary Key

Foreign Key

Department

D-No	D-Name	M-No
4	Finance	857
7	Sales	179

Primary Key

Recursive foreign key: A foreign key in a relation that references the primary key values of that same relation

Relational Objects...

Department

D-No	D-Name	M-No
4	Finance	857
7	Sales	179

Primary Key

Foreign Key

Employee

E-No	E-Name	D-No
179	Silva	7
857	Perera	4
342	Dias	7

Primary Key

Foreign Key

Salary

E-No	Eff-Date	Amt
179	1/1/98	8000
857	3/7/94	9000
179	1/6/97	7000
342	28/1/97	7500

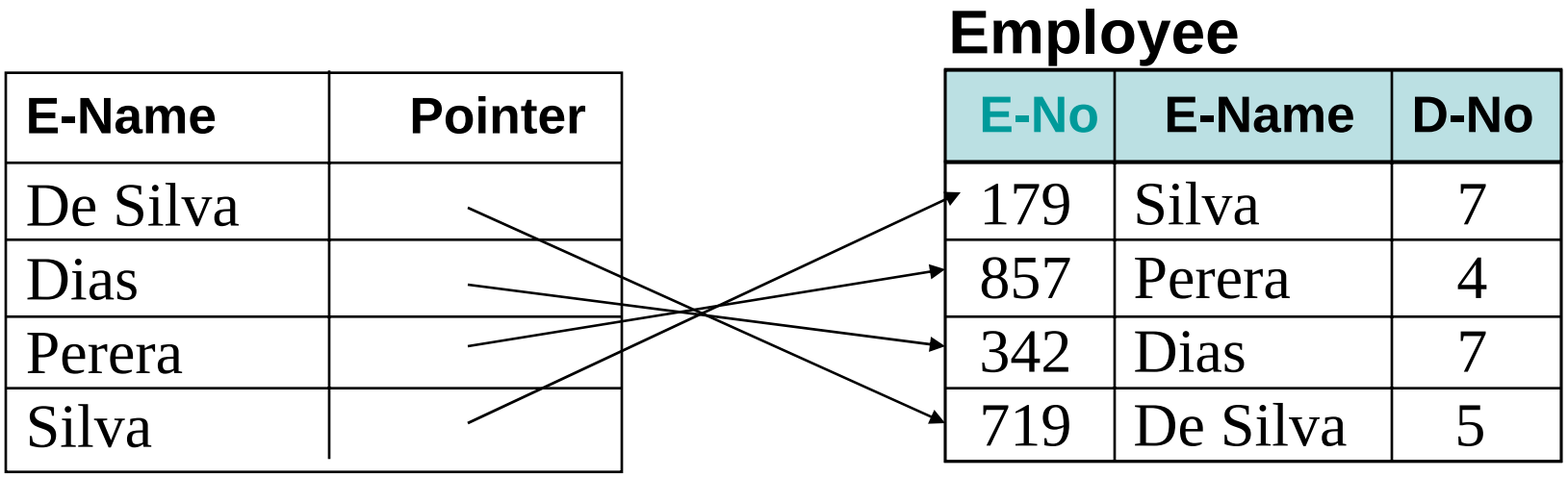
Foreign Key

Primary Key

Rows in one or more tables are associated with each other solely through data values in columns (no pointers).

Relational Objects

- Index
  - An ordered set of pointers to the data in the table



Index: Employee Name

E-Name	Pointer
Alwis	
Bandara	
Costa	
De Silva	
Dias	
Opatha	
Peiris	
Perera	
Silva	
Vaas	
Wickrama	
Zoysa	

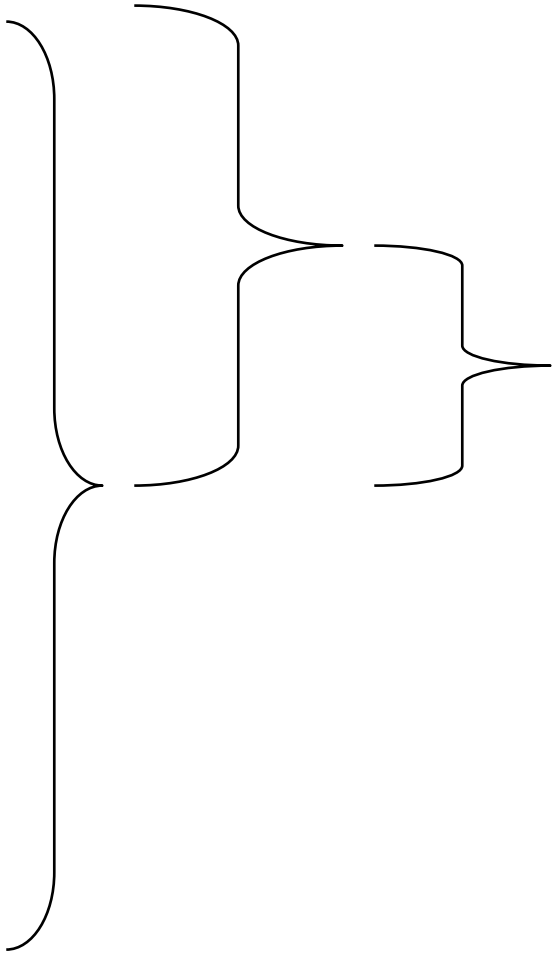
Employee

E-No	E-Name	D-No
179	Silva	7
857	Perera	4
342	Dias	7
719	De Silva	5
587	Alwis	4
432	Costa	6
197	Zoysa	2
875	Peiris	4
324	Vaas	7
917	Bandara	3
785	Opatha	2
234	Wickrama	1

Search: Employee Dias

- Index

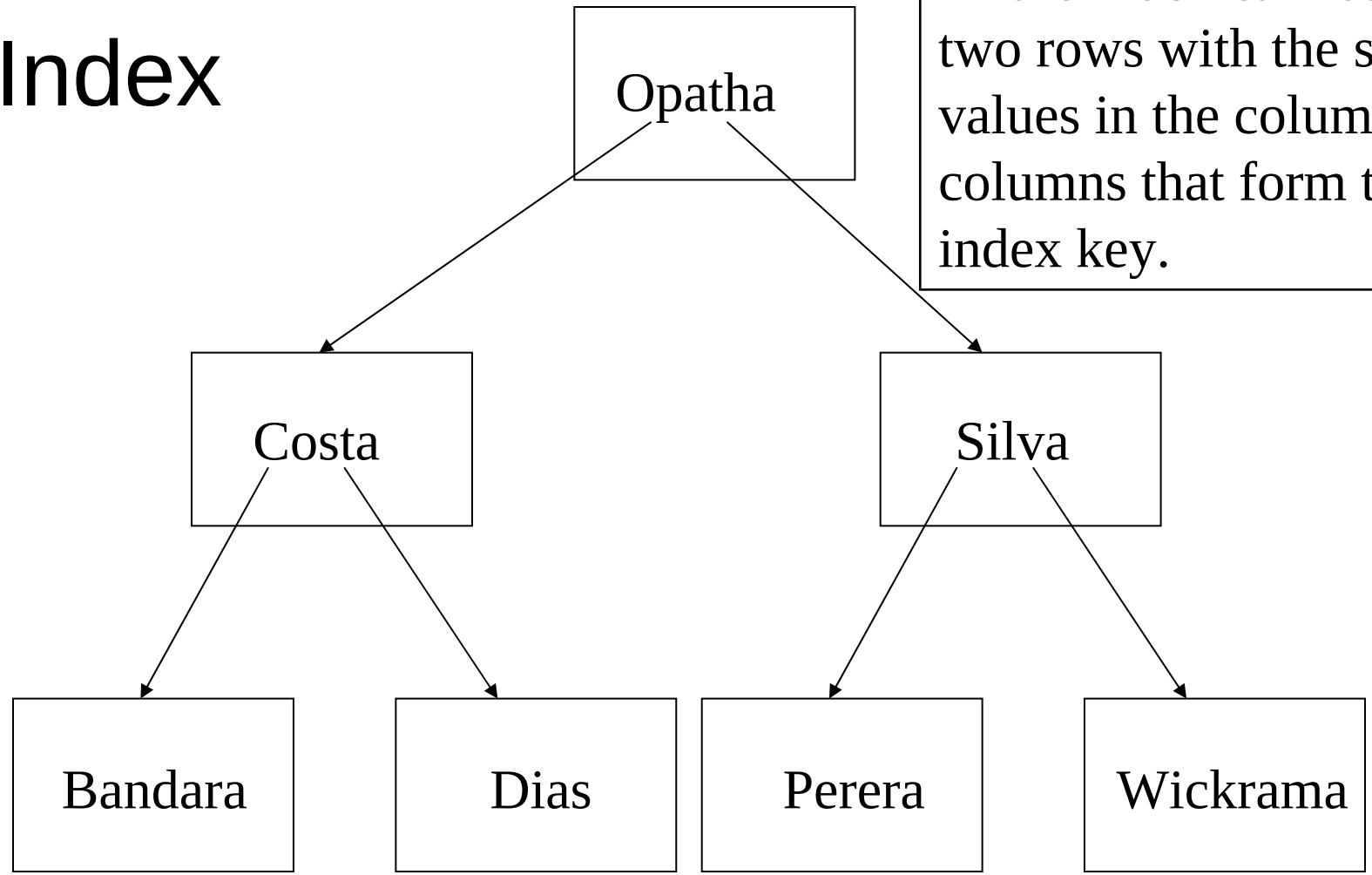
  Improves performance. Access to data is faster



E-Name	Pointer
Alwis	
Bandara	
Costa	
De Silva	
Dias	
Opatha	
Peiris	
Perera	
Silva	
Vaas	
Wickrama	
Zoysa	

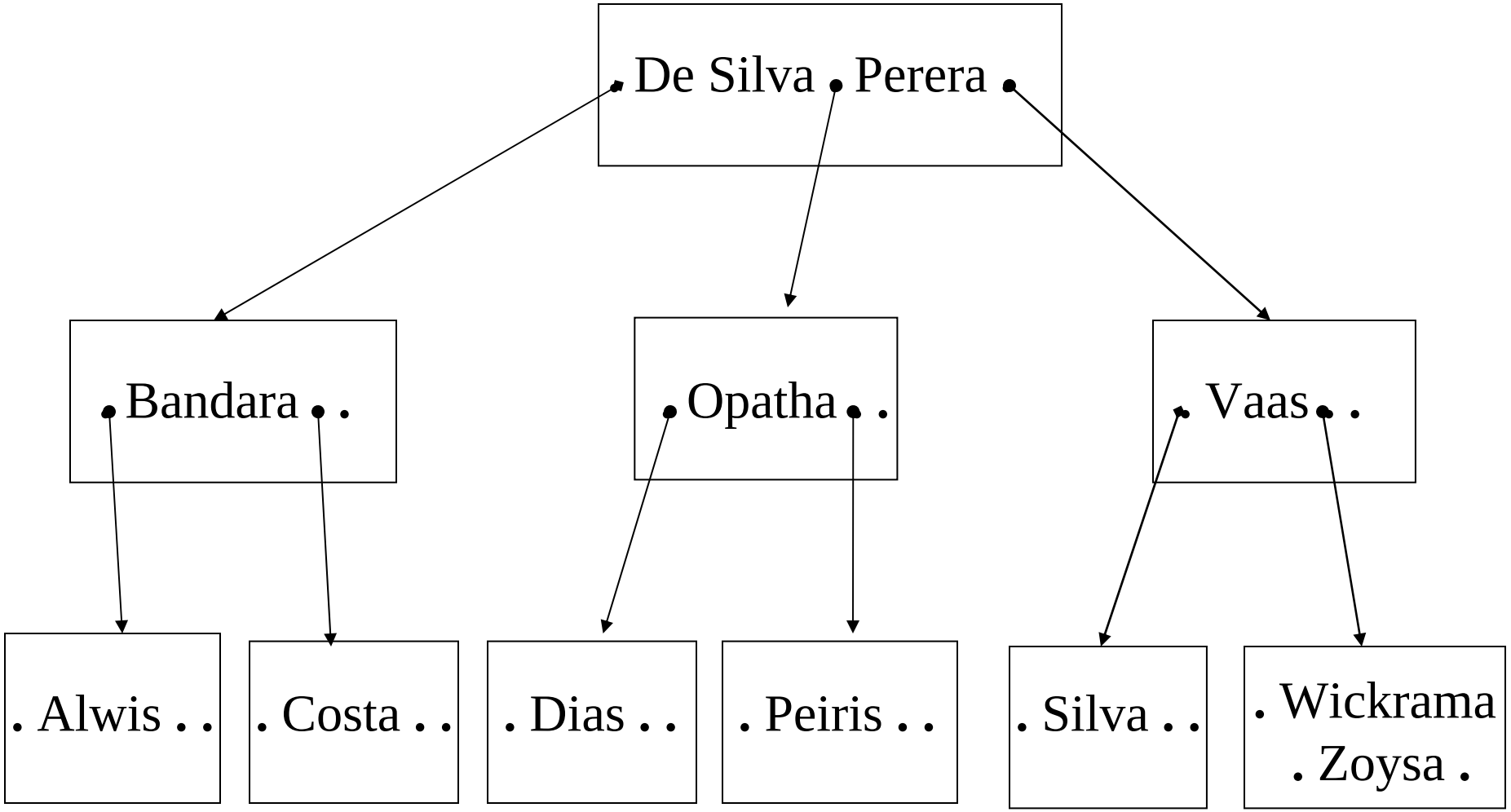
Search: Employee Dias

- Index



Ensures uniqueness.
A table with unique fields in the index cannot have two rows with the same values in the column or columns that form the index key.

Search: Employee Dias



Relational Database

STORE
Store Name | City

INVENTORY
Store Name | Part No | Quantity

ORDERS
Store Name | Part No | Vendor No | Order No | Quantity

PART
Part No | Description

VENDOR
Vendor No | Vendor Name

STORE
Store 1 | Colombo
Store 2 | Kandy

INVENTORY
Store 1 | P1 | 50
Store 1 | P3 | 20
Store 2 | P2 | 100
Store 2 | P1 | 30

ORDERS
Store 1 | P3 | 3428 | 0052 | 10
Store 2 | P2 | 3428 | 0098 | 7
Store 2 | P3 | 3428 | 0098 | 15
Store 2 | P4 | 5726 | 0099 | 1

PART
P1 | Printer
P2 | Diskette
P3 | Disk Drive
P4 | Modem

VENDOR
3428 | East West
5726 | DMS